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| 09/530,122 | 04/20/2000 | HIROKI NAKAHARA | 9319S-000126 | 2816 |

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| EXAMINER | |
|---|---|
| QI, ZHI QIANG | |
| ART UNIT | PAPER NUMBER |
| 2871 | |

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. 09/530,122 | Applicant(s) NAKAHARA ET AL. | |
|---|---|---|---|
| | Examiner Mike Qi | Art Unit 2871 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21 and 23-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21 and 23-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Feb.4, 2005 has been entered.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 10, 17, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 6,507,381 B1 (Katsuya et al), US 5,317,434 (Ohara) and 5,818,625 (Forgette et al).

Claims 1, 10, 17, 23 and 24, AAPA discloses (page 1, line 10 – page 4, line 21; Figs.11-12) that a conventional liquid crystal panel comprising:

- a pair of substrates (1, 2) (large substrate having a plurality of smaller substrate forming region divided by cutting lines L1, L2) bonded to each other by sealant (3) with a predetermined gap therebetween, and a liquid crystal encloses in a gap (31) (enclosed in an inner region delimited by the sealant);

- first electrodes (6A) formed on an inner side of the first substrate (1);
- a first alignment layer (13) formed on the first electrodes (6A);
- a second electrodes (7A) formed on an inner side of the second substrate (2);
- a second alignment layer (23) formed on the second electrodes (7A);
- the first electrodes (6A) and the second electrodes (7A) must have terminals formed on the first and second substrates (1,2) for conducting between the first and second electrodes (6A, 7A).

AAPA does not explicitly disclose that each of the alignment layers is formed on and cover an inner region delimited by the sealant; the alignment layer is formed from the inner region to the sealant region and partially overlapping the sealant region, along a side of the sealant with the terminals; and the second alignment layer crosses over the sealant region to an outer side of the sealant along a side of the sealant other than the side with the terminals; and the terminals being arranged in a sealant region and connected through a conductive particle included in the sealant.

However, Katsuya discloses (col.4, line 59 – col.8, line 3; Fig.2) that a structure of a liquid crystal panel (10) in which the alignment films (12a, 12b) cover the inner region delimited by the sealant (15), and such construction of the liquid crystal panel make it possible to miniaturize the liquid crystal panel itself.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the alignment films cover the inner region delimited by the sealant for achieving miniaturized liquid crystal panel.

Still lacking limitation is such that the alignment layer is formed from the inner region to the sealant region and partially overlapping the sealant region, along a side of the sealant with the terminals; and the second alignment layer crosses over the sealant region to an outer side of the sealant along a side of the sealant other than the side with the terminals.

However, Ohara discloses (col.2, lines14-36; Fig.2) that the orientation film (5) is formed so that it extends outside the region which underlies the opposing substrate, or in other words, the orientation film (5) extends beyond the area defined by the overlap of the two substrates. The two substrates are bonded by the sealant, so that the orientation film (5) is formed from the inner region to the sealant region and partially overlapping the sealant region, and crosses over the sealant region to an outside of the sealant. Because the alignment film has a rectangle shape, so that one side of the alignment layer must be along a side of the sealant with terminals and one side of the alignment film without terminals. Ohara indicates (col.2, lines 24-36) that the extended portion of the orientation layer functions as a protective layer for the signal input portion of the electrode (terminals), thus, electric corrosion reactions are prevented and disconnection of the electrode is thereby avoided, and reliability is enhanced.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the alignment film extending outside to prevent the electric corrosion reaction and enhancing the reliability.

Still lacking limitation is such that the terminals being arranged in a sealant region and connected through a conductive particle included in the sealant.

However, Forgette discloses (col.56, line 66 – col.16, line 53; Fig.5a) that the sealing member (116) comprises a typical sealing material such as epoxy (116a) with conductive particles (116b) contained therein so as to ensure sufficient conductivity between the reflector/electrode area (120a) and the transparent conductive material (128), i.e., to ensure the conductivity between the two electrodes with terminals.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the terminals in a sealant region and connected through a conductive particles included in the sealant for achieving a sufficient conductivity between the two electrodes with terminals.

Accordingly, it would have been obvious to those skilled in the art at the time the invention was made to arrange the alignment layers to cover and to cross the sealant forming region and conductive particles included in the sealant as claimed in claims 1, 10, 17, 23 and 24 for miniaturizing the liquid crystal panel, enhancing the reliability and achieving a sufficient conductivity between the two electrodes with terminals.

3. Claims 2-9, 11-16, 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Katsuya, Ohara and Forgette as applied to claims 1, 10, 17, 23 and 24 above, and further in view of US 5,150,239 (Watanabe et al)

Claim 2, lacking limitation is such that the sealant is a one-part thermosetting epoxy sealant.

However, Watanabe discloses (col.1, lines 14-35) that a one-pack type or single-liquid type epoxy resin adhesive (such as one-pack type thermosetting epoxy adhesive) has been conventionally used as an adhesive for constituting a sealant for liquid crystal

cells, because of its high strength and excellent heat resistance, chemical resistance and moisture resistance, etc.

Therefore, it would have been obvious to those skilled in the art to use one-part thermosetting epoxy as a sealant as claimed in claim 2 for achieving high strength and excellent heat resistance, chemical resistance and moisture resistance, etc.

Claims 3-4, lacking limitation is such that the alignment layers are formed up to a region overlapping the sealant forming regions corresponding to the four sides of the substrate.

However, as shown in Fig. 12 of AAPA, the rectangular substrates have four sides, so that the sealant must be deposited corresponding to at least three sides of the substrates (one side would be used for the input-output terminals and terminals for conducting between substrates, i.e., the electrical wirings) and the alignment layer formed up to edges of the substrate so as to conducting the liquid crystal to display image efficiently.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the sealant corresponding to four sides of the substrates or at least three sides excluding one side for the electrical wirings as claimed in claims 3-4 for achieving good sealing between the substrates and display image efficiently.

Claim 5, the limitations are the same as the claim 4. Therefore, claim 5 is redundant.

Claims 6-9, using product-by-process limitations, but the patentability is based on the product itself (see MPEP 2113).

AAPA discloses (Figs.11-12) that the electrodes (6A, 7A) are formed on the surface of a large substrate (1 or 2) for forming a plurality of pair of substrates (1A, 2A) along cutting projection lines (L1, L2).

Lacking limitation is such that the alignment layers are formed overlapping the sealant including the cutting projection lines.

However, Katsuya discloses (Fig.2) that the alignment layers are formed to overlap the sealant forming region other than the region for conducting between the substrate, and overlapping the edge portion of the sealant (the cutting projection lines), and alignment films would be formed in strips along the cutting projection line, and that would have been at least obvious as to miniaturize the liquid crystal panel itself.

Claims 11-14, lacking limitation is such that the alignment films are interposed between the sealant and the substrate, and extend to the perimeter of the substrate.

However, Katsuya discloses (Fig.2) that the first alignment layer (12a) is interposed between the sealant (15) and the first substrate (11a); the second alignment layer (12b) is interposed between the sealant (15) and the second substrate (11b); the first alignment layer (12a) extends to a perimeter of the first substrate (11a); and the second alignment layer (12b) extends to a perimeter of the second substrate (11b). As the explanation of the Katsuya above, such structure of liquid crystal panel would miniaturize the liquid crystal panel, and the display area would be utilized efficiently, and it would enlarge the image display region.

Therefore, it would have been obvious to those skilled at the time the invention was made to arrange the alignment layers as claimed in claims 11-14 for miniaturizing the liquid crystal panel and efficiently utilizing the display area.

Claim 15, AAPA discloses (Fig.12) that the rectangular substrates have four sides, and one side would be used for the input-output terminals, i.e., the electrical wirings.

Claim 16, AAPA discloses (Fig.11) that a first transparent insulating film (12) interposed between the first alignment layer (13) and the first substrate (1) over the first electrodes (6A); a second transparent insulating film (22) interposed between the second alignment layer (23) and the second substrate (2) over the second electrode (7A); and the Fig.11B shows the first and second transparent insulation films (12,22) are complementing a configuration of the first and second alignment layers (13,23).

Claims 18-19, lacking limitation is such that the alignment layers overlap the sealing region and the cutting lines.

However, Katsuya discloses (Fig.2) that a structure of a liquid crystal panel in which the alignment films (12a, 12b) are deposited to overlap the sealing deposit region (15) and extends to the edge portion of the panel, so that the alignment films (12a, 12b) are also overlap the plurality of projected cutting lines. As the explanation of the Katsuya above, such structure of liquid crystal panel would miniaturize the liquid crystal panel, and the display area would be utilized efficiently, and it would enlarge the display area.

Therefore, it would have been obvious to those skilled at the time the invention was made to arrange the alignment layers as claimed in claims 18-19 for miniaturizing the liquid crystal panel and efficiently utilizing the display area.

Claim 20, AAPA discloses (Fig.11-12) that to bond the substrates must deposit the sealant on the sealant deposit region, and it is a conventional in the art to deposit the sealant on each smaller substrate, since that would achieve a stronger bonding.

Claim 21, AAPA discloses (Figs.11-12) that bonding the pair of large substrates by sealant (3) along each small substrate; cutting the pair of substrates along the projecting cutting lines (L1, L2).

4. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Katsuya, Ohara and Forgette as applied to claims 1. 10, 17, 23 and 24 above, and further in view of US 5,150,239 (Watanabe et al) and US 4,759,614 (Yokokura et al).

Claims 25-26, lacking limitation is such that a transparent insulating film formed on the electrodes to cover the inner region delimited by the sealant; and the alignment layers are formed on the transparent insulation film; and the transparent insulating film and the alignment layers are formed from the inner region to an intermediate portion of a sealant region along a side with terminals, and transparent insulating film and the second alignment layer cross over the sealant region to an outside of the sealant along a side other than the terminals.

However, Watanabe discloses (col.3, lines 17-29; col.1, lines 30-35; Fig.1) that an insulating layer (104) and an alignment film (105) formed on the electrodes (102) to

cover the inner region delimited by the sealant (106); and the alignment layer (105) is formed on the insulation layer (104); and the rectangular substrates having four sides, and the electrical wire terminals on one side, so that the sealant must have one side with terminals. Such that the insulation layer (104) and the alignment layer (105) are formed from the inner region to an intermediate portion of a sealant region (106) along one side with terminals and cross over the sealant (106) along the side other than the side with terminals as shown in the Fig.1. Watanabe indicates (col.1, lines 3-35) that the pair of substrates superposed in alignment with each other and followed by pressing bonding, and using such structure (the alignment film and the insulation film cross over the sealant region) would effectively achieve the pressure bonding for pressing the sealant to provide the entire panel having uniform gap.

Concerning the first and the second alignment layers are formed on the transparent insulating film, and the transparent film and the second alignment layer cross over the sealant region to an outer side of the sealant that would be an obvious variation to arrange the transparent film and the second (such as the lower) alignment layer cross over the sealant region.

As an evidence, Yokokura discloses (col.6, lines 7-20; Fig.1) that the orientation control films (24, 26) (alignment layers) are formed on the light-transmitting insulating layers (20, 22) (transparent insulating layers), and the transparent insulating layers and the alignment layers overlapping spacer (28), and as shown in the Fig.1, the spacer 28 functions as sealant region to seal the periphery of substrates, so that the transparent insulating layers and the alignment layers overlapping the sealant region and as the

Watanabe disclosed to cross over the sealant region. Yokokura inducates (col.2, lines 19-21; col.6, lines 60-61) that such liquid crystal have a uniform molecule orientation characteristic, and more uniform molecule orientation would obtain large value of the contrast ratio. Therefore, the transparent film and the second alignment layer cross over the sealant region to an outer side of the sealant that would be an obvious variation.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange transparent insulation film and second alignment layer as claimed in claims 25-26 for achieving an entire uniform gap between substrates and uniform molecule orientation and obtaining a high contrast ratio.

***Response to Arguments***

5. Applicant's arguments filed on Feb.4, 2005 have been fully considered but they are not persuasive.

Applicant's argument s are as follows:

1) The references do not provide motivation to utilize a configuration where the terminal are arranged in the sealat region and connected through a conductive particle included in the sealant, and the second alignment layer cross over the sealant region.

Examiner's responses to Applicant's arguments are as follows:

1) The reference Forgette discloses (col.56, line 66 – col.16, line 53; Fig.5a) that the sealing member (116) comprises a typical sealing material such as epoxy (116a) with conductive particles (116b) contained therein so as to ensure sufficient conductivity between the reflector/electrode area (120a) and the transparent conductive material

(128), i.e., to ensure the conductivity between the two electrodes with terminals. The reference Ohara discloses (col.2, lines14-36; Fig.2) that the orientation film (5) is formed so that it extends outside the region which underlies the opposing substrate, or in other words, the orientation film (5) extends beyond the area defined by the overlap of the two substrates. The two substrates are bonded by the sealant, so that the orientation film (5) is formed from the inner region to the sealant region and partially overlapping the sealant region, and crosses over the sealant region to an outside of the sealant. Because the alignment film has a rectangle shape, so that one side of the alignment layer must be along a side of the sealant with terminals and one side of the alignment film without terminals. Ohara indicates (col.2, lines 24-36) that the extended portion of the orientation layer functions as a protective layer for the signal input portion of the electrode (terminals), thus, electric corrosion reactions are prevented and disconnection of the electrode is thereby avoided, and reliability is enhanced. The combination would ensure the conductivity between the two electrodes with terminals and enhance the reliability, and that is the motivation.

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi

Mike Qi
Patent Examiner
March 25, 2005